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suming this star to be near the center of the universe, it would follow that

$$\sigma = 3.9 \times 10^{-19}d$$

in which d is the density of ordinary air. That is, the density of the universal gaseous medium in the solar system would be of the same order of magnitude as the ether. On this basis the density of the medium at a distance of 585,000 miles from the center becomes equal to that of ordinary air, and the concentric sphere of the medium within this radius would have a mass about seven times that of Jupiter, a mass entirely too small to be conspicuous in celestial space.

Condition of Atmosphere, Horizon, and Seeing at the Lowe Observatory, Echo Mountain, California: Professor EDGAR L. LARKIN, Director Lowe Observatory. Read by title.

The officers elected for the next meeting are:

Vice-President—Otto H. Tittmann, Superintendent United States Coast and Geodetic Survey.

Secretary—Professor Laenas G. Weld, University of Iowa.

CHARLES S. HOWE,
Secretary.

SCIENTIFIC BOOKS.

Ueber den derzeitigen Stand der Descendenzlehre in der Zoologie. Von DR. H. E. ZIEGLER, Professor an der Universität Jena. Gustav Fischer. 1902. Pp. 54, with 4 text-figures. M. 1.50.

On the occasion of the seventy-third meeting of the German Naturalists and Physicians in Hamburg, September, 1902, the general question of the present status of the doctrine of organic evolution was presented in three lectures—by a botanist (de Vries), a paleontologist (Koken) and the zoologist, Ziegler. The last lecture is now somewhat extended by notes and appendices and published under the title given above.

It is an interesting account of the present standing of the great *Descendenzlehre* in zoology, given in a temperate spirit; a good lecture for the occasion and the place in which it was delivered.

The subject is considered under four sections: (1) The general theory of organic evolution, (2) natural selection, (3) inheritance theories and (4) the application of evolution to the origin of mankind.

Of these, the first section is treated with a firmer hand, as is justified by the state of our knowledge, and the author reviews interestingly, from the zoological side, some of the evidences in support of evolution. He points out that the general proposition has been so strengthened by the researches of the past forty years that all naturalists agree in accepting it as established. We have no other rational theory of the origin of plants and animals, and, notwithstanding the controversies as to the factors that have brought about the diversity of organic life, the fact of evolution as a process of creation is no longer seriously challenged.

But the compelling arguments in support of evolution do not hold in equal force for natural selection or any other particular theory. Here we have conflicting opinions, but they do not seriously affect the main contention. As Huxley, one of the greatest supporters of natural selection, said: 'If the Darwinian hypothesis were swept away, evolution would still stand where it was,' and the same thing can be said in reference to any theory of evolution that has been offered since.

In regard to natural selection, Ziegler comes to the position of so many working zoologists, that as a factor it is not adequate by itself to afford an explanation of variation and development. In many instances its action is clear—as when variations which are of direct use to the animal are fostered by natural selection, but many other cases like the great development of the backward-directed tusks of the mammoth, and horns of other animals, can not be explained by natural selection.

The third section is more lightly treated. The inheritance theories of de Vries, Nägeli, Haacke and Weismann receive passing men-

tion, but the intricacies of the subject prevented the lecturer from entering into a discussion of them.

In reference to the applicability of evolution to man's origin, the evidences in favor of an affirmative answer have been growing. The discovery, in 1894, of remains of an intermediate type between the higher apes and man—*Pithecanthropus erectus*—bears upon the question. The intermediate character of that form was well brought out by the opinions expressed by competent anatomists, some declaring the remains to be of an ape-like form and others of primeval man.

But more suggestive evidences are found in the comparative study of animal intelligence and of the structure and physiology of the brain. There is a gradual increase in intelligence with increase in complexity of the brain, and the discovery of localized areas presiding over definite coordinated acts brings evidence of the close relation between brain structure and mentality. Clinical studies and criminal anthropology show that disorders of the will and mental derangements are dependent upon disorders of the nervous system. Man can not be separated in his development from other animals; he differs from them in the degree of his development, and his nobility depends, not on his origin, but on how far he is advanced beyond it.

The text of the lecture is followed by six appendices, made up largely of apt quotations which help to show the state of opinion and to illuminate some points of the lecture.

WILLIAM A. LOCY.

Oeuvres Complètes de J.-C. Galissard de Marignac: Hors-série des Mémoires de la Société de Physique et d'Histoire Naturelle de Genève. Geneva, Eggimann et Cie.; Paris, Masson et Cie, et al. Vol. I. 4to. Pp. lv + 701.

The collected publication of the scattered writings of a great scientific man forms one of the most adequate and fitting memorials of him, because it enables many otherwise ignorant to perceive the way in which he attained greatness. The present volume, which covers twenty years of the life of the

eminent Swiss chemist, is no exception to this rule. It contains, in the first place, an interesting biography by E. Ador, filling the first fifty-five pages, and after this Marignac's papers on atomic weights, crystallography and other chemical and physicochemical subjects, arranged in chronological order, as far as 1860.

These papers form a notable record of unusual ability, enthusiasm and perseverance, of which any nation may well be proud. Only one lack is to be noticed in the present publication, in common with many other French books, namely, the lack of an index. This deficiency may well be supplied in the second installment; for it is to be hoped that this handsome volume will soon be followed by another, completing the record.

THEODORE WILLIAM RICHARDS.

SOCIETIES AND ACADEMIES.

AMERICAN MATHEMATICAL SOCIETY.

DURING the Christmas holidays the American Mathematical Society held a series of three meetings, at New York, Chicago and San Francisco. The ninth annual meeting of the entire society was held at Columbia University, on Monday and Tuesday, December 29-30. The San Francisco Section held its second regular meeting at the University of California, December 23. The Chicago Section met at the University of Chicago, January. 2-3. The meetings were well attended. The several programs included some fifty papers, being about one third of the society's annual production. Ten years ago the United States hardly produced one sixth of this amount of mathematical material. The comparison fairly represents the recent great advances in mathematical interest in this country.

Reports of the sectional meetings will appear separately in SCIENCE. The annual meeting, at New York, was attended by sixty members of the society. Twenty-six papers were read at the four sessions. The council announced the election of the following persons to membership in the society: Dr. A. B. Coble, University of Missouri; Mr. W. R. Cornish, State Normal School, Cortland, N.